

CLAIMS

1. An electrorheological device comprising an electrorheological fluid and electrode configuration arranged such that an electric field is generated having a significant component parallel to the direction of an anticipated external stress field.
2. A device as claimed in claim 1 wherein said electrode configuration comprises a plurality of positive and negative electrodes formed on an insulating substrate, said electrodes being disposed on said substrate so as to provide a series of equidistantly spaced alternately positive and negative electrodes in the said direction.
3. An electrorheological clutch comprising, a cylindrical drive member, a cylindrical driven member and an electrorheological fluid disposed between said drive member and said driven member, wherein said clutch further comprises an electrode configuration for generating an electric field, said electrode configuration being such as to generate a significant component perpendicular to an axis of rotation of said drive and driven members, and parallel to the surfaces of the drive and driven members.
4. A clutch as claimed in claim 3 comprising a cylindrical rotor provided within a cylindrical housing, said rotor being adapted to rotate about said axis of rotation, and said electrode configuration comprising a plurality of strip electrodes parallel to said axis of rotation and spaced equidistantly about said axis of rotation such that positive and negative electrodes alternate about said axis.
5. A clutch as claimed in claim 4 wherein the spacing between the rotor and the cylindrical housing is of the same order as the spacing between the strip electrodes.

6. A clutch as claimed in claim 4 wherein said cylindrical rotor is provided at opposite ends with first and second electrodes, and wherein said strip electrodes extend from said first and second electrodes on the outer surface of said cylindrical rotor toward the other of said first and second electrodes.

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7. A clutch as claimed in claim 6 wherein strip electrodes parallel to the axis of rotation are additionally provided on the inner surface of the cylindrical housing.

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8. A clutch as claimed in claim 6 wherein the strip electrodes extending from the first electrode toward the second electrode, and the strip electrodes extending from the second electrode toward the first electrode are of equal length and are equally spaced from each other.

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9. Apparatus for restricting the flow of an electrorheological fluid, comprising: a channel defining a flow path for said electrorheological fluid, said channel being formed of an insulating material and being formed with a plurality of electrodes thereon, said electrodes extending transversely to said fluid flow path and alternate electrodes being respectively positively and negatively charged.

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10. Apparatus as claimed in claim 9 wherein said electrodes are equidistantly spaced from each other in the direction of fluid flow.

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11. Apparatus as claimed in claim 10 wherein the channel has a width of the order of the spacing between two adjacent electrodes.

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12. Apparatus as claimed in claim 9 wherein said channel is tubular and said electrodes extend around an inner circumference of said channel.
13. Apparatus as claimed in claim 9 wherein said channel is defined by two parallel insulating plates and said electrodes are formed on one of said plates.

14. A tubular member of variable stiffness, comprising a sheet of insulating material rolled about an axis to define said tubular member, said sheet of insulating material being formed with alternating positive and negative strip electrodes arranged on said insulating sheet such that each strip electrode extends transversely to said axis and such that alternating negative and positive electrodes are equidistantly spaced along said axis, and an electrorheological fluid provided between said electrodes.
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